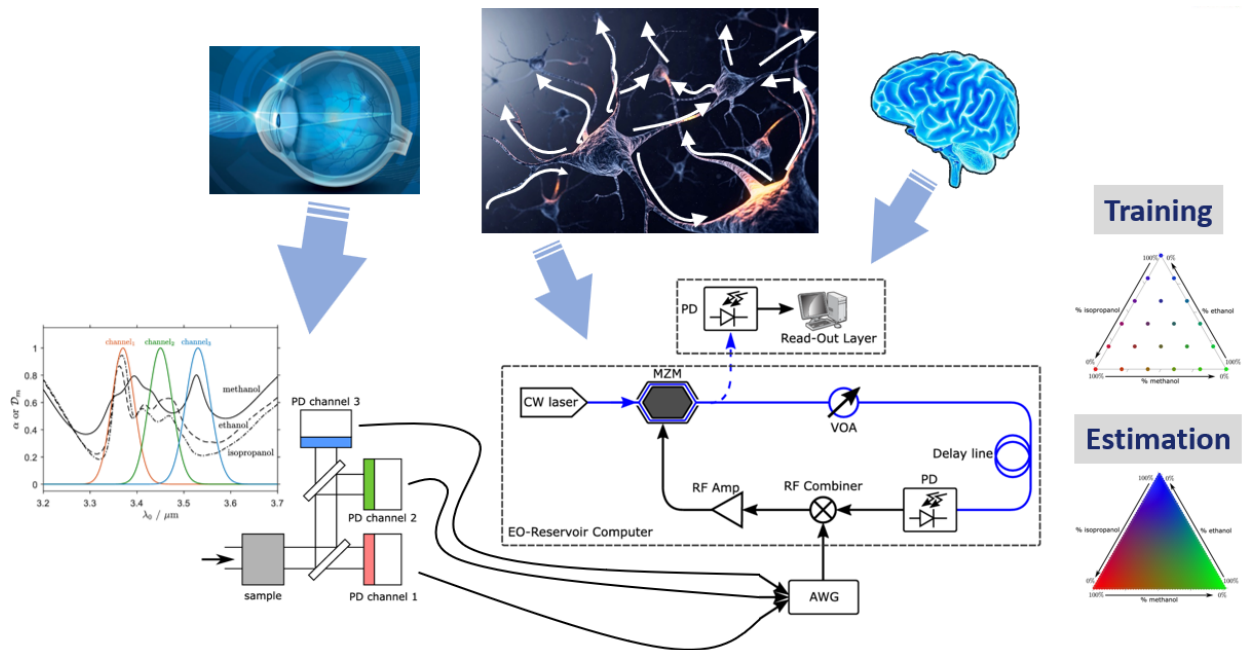


# Optics and Photonics Group Lunchtime Seminar “Towards photonic-machine perception”

Sendy Phang

*George Green Institute for Electromagnetics Research, University of Nottingham*



13:30 Wednesday 06 April 2022  
C24 Coates building  
All Welcome

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# “Towards photonic-machine perception”

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MS Teams link

This talk is based on publication [arXiv:2202.01763]. A fully bio-inspired apparatus to perform non-spectroscopic sensing to discriminate and determine the constituent concentrations of a chemical mixture is proposed. Here, fully bio-inspired means that it is comprised of a biomimetic sensor and a neuromorphic signal processor. The sensor is similar to the human eye in terms of its trichromat architecture and overlapping spectral response. The information processor is a neuromorphic system based on an electro-optical implementation of a reservoir computer. A time-stepping signal algorithm based on the Z-bilinear transformation has been developed to realistically simulate the electro-optical reservoir computer; this demonstrates the discrimination and chemical concentration determination tasks. We believe such an apparatus offers potential benefits in areas in which chemical composition needs to be monitored in real time, for example in chemical processing, and food-beverage (fermentation/brewing) and environmental monitoring.